

Superfund Meeting Reports

Superfund Basic Research Program Meeting Reports: Introduction

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The Superfund Amendments and Reauthorization Act (SARA) of 1986 established a university-based program of basic research within the National Institute of Environmental Health Sciences (NIEHS) to complement existing activities conducted by the Environmental Protection Agency, the manager of the Superfund Program, and the Agency for Toxic Substances and Disease Registry. The NIEHS Superfund Basic Research Program supports a wide range of research to address the broad public health concerns arising from the release of hazardous substances and hazardous wastes into the environment, particularly from uncontrolled, leaking waste-disposal sites.

The Superfund Basic Research Program's primary objectives are to expand the base of scientific knowledge in this research area, reduce the amount and toxicity of hazardous substances, and, ultimately, prevent adverse human health effects. To accomplish these objectives, NIEHS has awarded 11 coordinated, multicomponent, interdisciplinary research programs that link basic biomedical research with related ecologic, hydrogeologic, and engineering studies. Through these programs, the Superfund Basic Research Program has stimulated collaboration among scientists in various disciplines, who otherwise would normally not have worked toward a common research goal, and, therefore, has generated novel discoveries.

In 1989, NIEHS staff developed the concepts behind four conferences (listed below), which were sponsored by the Superfund Basic Research Program in 1990. These conferences were held to bring together investigators from diverse disciplines and thereby foster interdisciplinary collaborations and timely transfer of technologies and information.

"Application of Molecular Biomarkers in Epidemiology" was held February 21-22, 1990, at NIEHS. The premise behind this meeting was that biomarkers are indicators of molecular and cellular events in biological systems and may allow epidemiologists to examine more thoroughly the relationships between environmental hazards and human health effects. This meeting provided its more than 280 participants with an up-to-date review of some of the molecular biomarkers currently available and those being developed. The current and future use of biomarkers in epidemiological studies at Superfund sites and in the work place was also discussed.

"Biodegradation of Hazardous Wastes" was held April 9-10, 1990, at Utah State University in Logan. The premise for this meeting was that biological treatment of hazardous wastes may allow engineers to treat environmental hazards such that potential human health effects are ameliorated, specifically by reducing the amount and toxicity of hazardous substances. This meeting included an up-to-date review of some of the biological degradation research currently available and undergoing development, and provided a forum to discuss this technology's impact on human health and the environment. Current and future use of biological treatment technologies at Superfund sites and elsewhere were discussed primarily from the perspective of technology transfer.

"Assessment of Human Exposure to Chemicals from Superfund Sites" was held at Michigan State University in East Lansing June 5-6, 1990. This meeting brought together a diverse group of scientists in a multidisciplinary framework to examine the current state of knowledge and research needs in chemical exposure assessment. Emphasis was placed on the environmental fate and transport of chemicals emanating from Superfund sites and on the validity of current models in assessing human exposure to these chemicals. Therefore, meeting participants focused on exposure assessment in the context of hazardous substance research involving hydrogeological, ecological, engineering, and biomedical sciences. To our knowledge, this conference served as the first forum for discussing exposure assessment from such multidisciplinary perspectives.

"Health Effects of Combustion By-Products" was held October 23-24, 1990, at the National Institutes of Health in Bethesda, Maryland, and was co-sponsored with the National Science Foundation. This meeting focused on health effects of combustion by-products related to incineration of Superfund wastes, bringing together investigators from diverse disciplines, combustion engineers, and biomedical researchers. The conference provided a review of the research currently being conducted on emissions from incinerators, mechanisms of formation of combustion by-products of importance to incineration, the distribution of these by-products in the environment, and their impact on human health. Sessions were organized on organic compounds, metals, halogenated organics, acid aerosols, and the benefits of interdisciplinary research.

The conferences sponsored by the Superfund Basic Research Program mirror the basic research supported by this Program and its approach, which emphasizes the use of advanced basic

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research to improve the sensitivity and specificity of techniques for detecting injury in humans or in ecological systems. Because it is a basic research program, however, it requires a long-term perspective. Therefore, this program is founded on the basis of long-term studies, with development of mechanisms to apply this work to real problems on a continual basis.

The Superfund Basic Research Program is a unique program recognizing and reflecting the fact that the study of the relation-

ship between hazardous substances in the environment and their effects on human health is in its infancy. These reports acknowledge fully that there are research gaps and opportunities; the program recommends that such gaps and opportunities be addressed through continued support of existing and new research programs. We believe that the investment in this basic research program will be well spent and that it will contribute to the effective management of hazardous substances in the environment.